

CURRICULUM VITAE

September 1, 2011

NAME: CHARLES L. HENRY, P.E., Ph.D.
Senior Lecturer, University of Washington, Bothell

ADDRESS: University of Washington - Bothell
Box 358530, 18115 Campus Way NE
Bothell, WA 98011-8246
(425) 352-3587

REGISTRATION: Registered Professional Engineer in Washington since 1979

EDUCATION: Ph.D. in Soils/Organics Management, 1989, Univ. of Washington.
M.S. in Environmental Engineering, 1977, Oregon State University.
B.S. in Civil Engineering, 1975, Oregon State University

PROFESSIONAL MEMBERSHIPS

Washington Science Teachers Association
North American Association for Environmental Education
Soil Science Society of America
World Toilet Association

PROFESSIONAL EXPERIENCE

Sustainable Practices

Composting. Design of sophisticated composting toilet facility for 7 beaches in Ecuador. Design and construction of three home-scale composting systems: a combination composting toilet and home food waste system, a backyard rotating drum, and a simple box system. Responsible for oversight of design/build barrel composting toilet system for a dormitory in India, a vault system in Costa Rica. Designed and built large-scale University of Washington Demonstration Compost Facility, and associated compost gardens. Developed and taught class in composting, including operation of compost facility. Experience in food waste, manures, paper waste, septage and biosolids, County fair waste, latex paint, and assorted other organics.

Renewable energy. Designed firewood plantations to be fertigated with effluent from public latrines and small wastewater treatment plants. Supervised building of efficient earth stoves in classes and on student study abroad programs. Biodiesel production and analysis: project with Emerald Ranches and USDA SBIR. Installation of wind monitoring equipment for public and private wind generator systems. Responsible for oversight of design/build solar PV system for dormitory in India, and solar hot water system for facility in Mexico. Designed and implemented poplar biomass plantations fertilized with organic residuals. Developed device for making biobricks for fuel from organic wastes.

Public restroom facilities. Designed and produced construction documents for a number of public toilets in the southern provinces of Afghanistan under Rampup-South, a US AID program. Waste treatment included total on-site reuse, composting toilets, greywater use, and traditional conservancy tanks. Work included assessment and planning for managing

wastewater pumped from septic and conservancy tanks. Developed alternatives for conversion of existing WWTPs for fertigation of biomass plantations.

Wastewater reuse. Responsible for design/build of a mulch bed reuse system in Mexico, oversight of design/build greywater system for a dormitory in India for banana plantation irrigation. Evaluation of small wetland treatment system and forest application system for campground. Evaluation of wastewater application to forested sites for small towns. Conceptual design for pilot biomass project for Vernon, BC.

Wastewater treatment. Produced alternatives and preliminary design, cost estimate and schedule for a 5000 person wastewater treatment plant in Mexico, designed on-site black and greywater treatment system for a rehabilitation center in Mexico, and responsible for oversight of design/build reedbed wastewater treatment system for a dormitory in India. Feasibility studies and design of sewage lagoons; on-site sewage facilities design; computer modeling of sewer systems; field data collection, evaluation and preparation of Facilities Plans.

Water systems. Efficiency analysis using computer modeling, and design of water systems; field data collection and evaluation of complete water system for Keyport Naval Base, including computer simulation analysis, field verification and inspection of all water system components. Design of water distribution systems. Responsible for oversight of design/build roof rainwater collection system for a dormitory in India and rehabilitation center in Mexico.

Art and Science. Initiation and involvement in interdisciplinary art and science projects, including recycled glass casting, supervision of a frog-cob oven, strawbale seat, architecturally pleasing composting toilet facilities, urban garden design, reed beds for wastewater polishing, and garbage art.

Organic Soil Amendments

Planning, design and implementation. Designed and permitted septage land application demonstration, Pack Forest. Preliminary and detailed site evaluations for biosolids applications to forest and agricultural lands for King County DNR (metropolitan Seattle area), Pierce County Utilities, and other small communities. Installation of forest sites, powerline right of way and cottonwood plantations. Development of biosolids transfer and storage facilities. Program promotion including tours, presentations, brochure development, symposium and workshop organization. Design of composted biosolids application sites. Design, review or installation of numerous projects with compost and other organic residuals. Planning and design of animal waste management facilities for individual farmers under a program promoted by the Soil Conservation Service.

Evaluation. Evaluation of a number of composted biosolids, yard waste compost, and municipal solid waste compost. Studies included plant germination tests, decomposition/mineralization, leachate analysis, growth response and plant uptake. Evaluation of use of septage as a forest and ag amendment; N mineralization, pathogen survival, nitrate leaching.

Regulations and guidance. Contributing author and technical reviewer of EPA Process Design Manual for Land Application of Municipal Sludge. Technical reviewer of EPA Guidance for Writing Case-by-Case Permit Requirements for Municipal Sewage Sludge. Author of Pierce County Sludge Utilization Policy. Contributing author of Seattle Metro Silvigrow Design and Operations and Maintenance Manual. Member of peer review

committee for EPA's 503 Technical Sludge Regulations. Member of EPA's Sludge Task Force developing national contaminant limits for biosolids application.

Restoration and Remediation

Use of compost in restoration of mountain logging roads. Authored "Guidelines for use of composted biosolids in the Greenway". Installation of research and demonstration plots to restore productivity in gravel pits near Tacoma, WA; and near Eatonville, WA. Installation of research and demonstration plots for evaluation of bioremediation mixes in highly contaminated tailings and hillslopes at Bunker Hill Superfund Site, ID; in tailings in Joplin, MO; in alluvial tailings, Leadville, CO; and contaminated wetlands in the Coeur d'Alene River Basin, ID.

Nutrient and Carbon Cycling

Nitrogen cycling: mineralization, ammonia volatilization, denitrification, plant uptake and nitrate leaching of biosolids, pulp and paper sludges, septage and other residuals. Developed new field technique for N mineralization. Field measurements of ammonia volatilization and denitrification from food processing wastewater and animal waste applications to agricultural lands. Primary author and editor for "Managing Nitrogen from Biosolids". Conducted a number of projects investigating N dynamics as a function of C:N ratio.

Fate of Contaminants

Produced four MSW composts for national study on the fate and uptake of contaminants from compost; evaluated trace metal uptake and phytotoxicity study for crops grown in these composts. Growth response and trace element uptake from various biosolids products. Managed relative trace metal uptake study (in coordination with W-170 Technical Committee) for crops grown in biosolids. Evaluated soil amendments for reduction of zinc and cadmium availability of tire fire ash for Everett, WA.

Literature Reviews. Completed technical literature review of compost quality (published by The Compost Council). Also produced literature review on MSW compost. Worked on approaches for compost classification system for Washington State. Completed comprehensive literature reviews on environmental effects of biosolids management: Trace Metals, Effects on Wildlife and Domestic Animals, Incinerator Emissions and Ash, Nitrogen, Pathogens, and Trace Synthetic Organics.

Presentations

Have given over 200 presentations and tours on land application of residuals and compost. Expert witness for lawsuit in Washington State, New Hampshire and for a trial in Oregon on biosolids utilization, expert witness in arbitration in Washington, prepared deposition for court case in Washington, and presented technical information at public hearings for biosolids utilization projects.

Foreign Work Experience

- 2011 US AID Rampup-South Program: Designed and developed construction documents for public toilets in Afghanistan. Developed alternatives for wastewater reuse, including biomass plantations.
- 2010 Gave a workshop on building composting toilets to staff at an international school in Kenya.
- 2009 Initiation of a research program for socialization and efficacy of composting toilet use in Ecuador. In collaboration with Universidad de Especialidades Espiritu Santo and Hogar de Cristo near Guayaquil.
- 2008 Construction and installation of a composting toilet facility at a school playground near Guayaquil, Ecuador.
- 2007 Designed seven composting toilet facilities for beaches in Ecuador.
Led construction of composting toilet for school in Guayaquil, Ecuador.

- Led construction of composting toilet for ecological center in Costa Rica.
- 2006 Faculty lead for student program of design/build of composting toilet in rural Costa Rica.
Led Sustainable Practices Program for K-12 Teachers in Costa Rica.
- 2005 Faculty lead for student program of design/build of sustainable systems in rural Costa Rica.
- 2005 Review and design assistance for Use of Native Phylogenetic Resources for Phytostabilization of Abandoned & Post-Operative Mine Tailings at the Coquimbo Region, Chile.
- 2004 Design/build assistance for bamboo bus stop in rural Costa Rica.
- 2003 Design/build sustainable systems for children's rehabilitation center in Xochitepec, Mexico.
- 2003 Design/build composting toilet for sustainable development in Costa Rica.
- 2002 Design/build sustainable systems for a dormitory in India, including teaching technology.
- 2001 Evaluation of remedial techniques for contaminated smelter sites in Mexico.
- 2001 Evaluation of sustainable infrastructure and wastewater treatment facilities. Auroville, India.
- 1998 Long range plan for sustainable forestry using residuals. The Muswellbrook Shire, NSW, Australia.
- 1997 Lecturer, "Use of organic residuals in forest landscapes", Bodenkultur Universitat, Vienna, Austria.
- 1994 Nitrogen dynamics following land application of biosolids. Greater Vancouver Regional District, Canada.
- 1993 Use of woodwaste to reduce nitrate leaching. Design assistance and review. Universitat de Alicante, Spain.
- 1993 Assessment of water quality impacts of mining activities in the Hei watershed, China.
- 1991 Technical Evaluation of NUTRIFOR Demonstration Sites for Greater Vancouver Regional District, Canada.

Foreign Student Trips

- 2010 Environmental literature and sustainability trip for 29 days to Ecuador for 15 UW Honors students. Trip will include visit to the Andes, the Amazon, the Galapagos and Guayaquil. Will work on computer literacy in a village in the Andes, restoration in the Galapagos, and building bamboo houses and composting toilets with Universidad de Especialidades Espiritu Santo and Hogar de Cristo near Guayaquil.
- 2010 Led an 8-day environmental and service trip to Guatemala for 17 EPS 9-11th graders. Worked in a coffee plantation, painted a school, cleaned a beach, and studied ecosystems.
- 2009 Led a 15-day environmental and service trip to Ecuador for eight EPS 7-8th graders. Included visit to the Andes, the Galapagos and Guayaquil. Worked on a new village library, taught soap-making, donated eight laptop computers (funded by Bellevue Rotary Club).
- 2007 Led an 8-day environmental and service trip to Costa Rica for 18 EPS 9-10th graders. Included visit to highlands and Caribbean Coast. Painted a school library, taught biodiesel and soap-making.
- 2006 Led a 9-day environmental and service trip to Costa Rica for nine UWB teachers and nurses. Included visit to Pacific Coast and central Costa Rica. Painted a school cafeteria, started a local school recycling program.
- 2006 Led a 5-day service trip to Costa Rica for 5 UWB students. Built a composting toilet on a private ranch on Peninsula de Nicoya.
- 2005 Led a 30-day environmental and sustainability trip to Costa Rica for 16 UWB & UW students. Included building a cob oven, bamboo workshop, and environmental assessments.
- 2003 Co-led a 17-day environmental and sustainability trip to Costa Rica for 12 students from UW. Included environmental assessments and building a composting toilet.
- 2003 Faculty member of a 3-month design-build of a rehabilitation center for children in Xochitepec, Mexico. 42 students and 5 faculty.
- 2002 Faculty member of a 3-month design-build of a dormitory in the American Pavilion in Auroville, India. 47 students and 5 faculty.

PUBLICATIONS

Thesis and Dissertation

- Henry, C.L. 1989. Nitrogen dynamics of pulp and paper sludge amendment to forest soils. Ph.D. dissertation.
- Henry, C.L. 1976. Losses of nutrient nitrogen from animal wastes through volatilization of ammonia. M.S. Project Report, Oregon State University, Corvallis. 34 p.

Recent Publications

- Henry, C., and B. McCarthy. 2011. Fighting a Different Battle – Sanitation. *BioCycle*; Aug 2011; 52, 8; J.G. Press, Inc.
- Henry, C., and E. Olsen. 2011. *Ecological Restoration Handbook*. <http://faculty.washington.edu/clh/ERH/>

- Henry, C. 2009. Biosolids: Ugly and Loved, and Yet ...Hated? ARCADE Architecture and Design in the Northwest. August 2009.
- Henry, C., and E. Olsen. 2009. Eastside Prep's Innovation in Environmental Literacy. BioCycle April 2009; 50, 4. J.G. Press, Inc.
- Henry, C., E. Olsen and M. Fioravanti. 2009. Improving Sanitation With Composting Toilets. BioCycle February 2009, Vol. 50, No. 2, p. 42.
- Henry, C., C. Kubota, M Groom, J. Eisele, W. Gold, and T. Clay. 2006. Bridging K-12/13-20 Science Education in Washington: Summer Environmental Education Days (SEED). WSTA Journal.
- Henry, C.L., and K. Bergeron. 2005. Compost Use in Forest Land Restoration. EPA number: EPA832-R-05-004. July 2005

Peer Reviewed Publications

- Brown, S., C.L. Henry, R.Chaney, H. Compton, and P.S. DeVolder. 2003. Using municipal biosolids in combination with other residuals to restore metal-contaminated mining areas. *Plant and Soil*, 249: 203-215
- Harrison, R.B., E.C. Turnblom, C.L. Henry, P. Leonard, R. King, and R. Gonyea. 2002. Response of three young Douglas-fir plantations to forest fertilization with low rates of municipal biosolids. *Journal of Sustainable Forestry* 14:21-30.
- Grey, M., and C. Henry. 2002. Phosphorus and nitrogen runoff from a forested watershed fertilized with biosolids. *J. Environ. Qual.* 31:926-936.
- Rosenfeld, P.E., and C.L. Henry. 2002. Activated Carbon and Wood Ash Sorption of Wastewater, Compost, and Biosolids Odorants. *Water Environment Research*.
- Harrison, R.B., J. Krejzl, N.S. Turner, J.A. Hoyle and C.L. Henry. 2001. Treatment of septic effluent for fecal coliform and nitrogen in coarse-textured soils: use of soil-only and sand filter systems. *Water, Air and Soil Pollution* 124:205-215.
- Rosenfeld, P.E., C.L. Henry, R.L. Dills and R.B. Harrison. 2001. Comparison of odor emissions from three different biosolids applied to forest soil. *Water, Air and Soil Pollution* 127:173-191.
- Rosenfeld, P.E., Henry, C, L. and Bennett, D. 2001. Wastewater dewatering polymer affect on biosolids odor emissions and microbial activity. *Water Environment Research*.
- Zabowski, D., C. Henry, Zheng, and Zhang. 2001. Mining impacts of trace metal content of water soil, and stream sediments in the Hei River basin, China. *Water, Air and Soil Pollution*.
- Rosenfeld, P.E., and C.L. Henry. 2000. Wood ash incorporation with biosolids for odor reduction. *Journal of Environmental Quality*.
- Rosenfeld, P.E., C.L. Henry, R. B. Harrison, and R. Dills. 2000. Comparison of Odor Emissions From Three Different Biosolids Applied to Forest Soil. *Water, Air, and Soil Pollution*.
- Chaney, R., S. Brown, T. Stuczynski, W. Daniels, C. Henry, Y. Li, G. Siebielec, M. Malik, S. Angle, J. Ryan, and C. Compton. 2000. Risk assessment and remediation of soils contaminated by mining and smelting of lead, zinc and cadmium. *Rev. Int. Contam. Ambient.* 16(4)175-192.
- Henry, C., M. Van Ham., M. Grey, N. Cowley, & R. Harrison. 1999. Field Method for N Mineralization Using Porous Ceramic Cups. *Water, Air, & Soil Pollution*.
- Grey, M.A. and C.L. Henry. 1999. Nutrient retention and release characteristics from two municipal solid waste composts. *Compost Science and Utilization.* 7(1):42-50.
- Yang, L., D. Xue, C.L. Henry and R.B. Harrison. 1998. Biosolids application and the effect on heavy metals. *Agro-Environmental Protection* 16:227-231.
- Yang, L., D. Xue, C.L. Henry and R.B. Harrison. 1998. Effects of biosolids on the nitrogen cycle and nitrate leaching. *Agro-Environmental Protection* 16:182-186.
- Henry, C., and D. Cole. 1998. Use of biosolids in the forest: Technology, economics and regulations. *Biomass and Bioenergy*.
- Harrison, R.B., D.W. Cole, C.L. Henry. 1997. Secondary impacts of ameliorative practices on nutrient retention and availability in forest soils. *Forest Ecology and Management*.
- Zabowski, D., and C. Henry. 1997. Soil and foliar nitrogen following fertilization of ponderosa pine. *New Zealand J. of Forestry Science*.
- Brallier, S., R.B. Harrison and C.L. Henry. 1996. Long-term trace metal plant availability after liming soils amended with high rates of sewage sludge. *Water, Air and Soil Pollution* 86:195-206.
- Harrison, R.B., S.P. Gessel, D. Zabowski, C.L. Henry, D. Xue, D.W. Cole and J.E. Compton. 1996. Mechanisms of negative impacts of three forest treatments on nutrient availability. *Soil Sci. Soc. Am. J.* 60:1622-1628.
- Henry, C., and R. Harrison. 1996. Carbon fractions in compost and compost maturity tests. *SSSA Special Publication No. 46*.
- Krejzl, J., R.B. Harrison, N. Turner, J. Hoyle and C.L. Henry. 1994. Methods for measuring deep leaching of chemical and microbiological constituents of effluent from septic systems. *Soil Sci. Soc. Am. J.* 58:131-133.
- Harrison, R.B., X. Dongsen, C.L. Henry and Dale W. Cole. 1994. Long-term effects of heavy applications of biosolids on organic matter and nutrient content of a coarse-textured forest soil. *Forest Ecology and Mgmt*, 66:165-177.

- Harrison, R.B., X. Dongsen and C.L. Henry. 1994. Magnesium deficiency in Douglas-fir and Grand fir growing on a sandy outwash soil amended with sewage sludge. *Water, Air and Soil Pollution* 74:1-14.
- Henry, C., D. Cole, and R. Harrison. 1994. Use of Municipal Sludge to Restore and Improve Site Productivity in Forestry: The Pack Forest Sludge Research Program. *Forest Ecology and Management*, 60:137-149.
- Henry, C., and D. Cole. 1994. Biosolids Utilization in Forest Lands. IN *Sewage sludge: Land Utilization and the Environment*. ASA-CSSA-SSSA, Madison, WI.
- Kissel, J.C., C.L. Henry and R.B. Harrison. 1993. Potential emissions of synthetic VOCs from MSW composting. *Biocycle* 34:76-78.
- Henry, C., D. Cole, T. Hinckley, and R. Harrison. 1993. The Use of Municipal and Pulp and Paper Sludges to Increase Production in Forestry. *J. Sustain. For.* 1:41-55.
- Dongsen, X., R.B. Harrison and C.L. Henry. 1992. Research on the Distribution of Nutrients and Heavy Metals in forest soil amended with municipal sewage sludge after 15 years. *Acta Univ. Agric. Boreali-occidentalis* 20:20-27.
- Epstein, E., R.L. Chaney, C.L. Henry, and T.J. Logan. 1992. Trace elements in municipal solid waste compost. *Biomass and Bioenergy* 3:3/4, p.227-238.
- Kissel, J., C. Henry, and R. Harrison. 1992. Emissions of volatile and odorous organic compounds from municipal waste composting facilities. *Biomass and Bioenergy* 3:3/4, p. 181-194.
- Henry, C. 1991. Nitrogen dynamics of pulp and paper sludge to forest soils. *Wat. Sci. Tech.* 24:3/4, pp. 417-425.
- Zasoski, R., R. Edmonds, C. Bledsoe, C. Henry, D. Vogt, K. Vogt, and D. Cole. 1984. Municipal sewage sludge use in forests of the Pacific Northwest, U.S.A.: Environmental concerns. *Waste Management & Research*.

Book/Proceedings Chapters

- Henry, C.L., D.W. Cole and R.B. Harrison. 2000. Nitrate Leaching from Fertilization of Three Douglas-fir Stands with Biosolids. *The Forest Alternative Symposium Proceedings*.
- Henry, C.L. 2000. The Role of Nitrogen in Residuals Management. *The Forest Alternative Symposium Proceedings*.
- Harrison, R., C. Henry, D. Xue, J. Canary, P. Leonard, and R. King. 2000. The fate of metals in land application systems. *The Forest Alternative Symposium Proceedings*.
- Bennett, D., and C. Henry. 2000. Monitoring water quality in watersheds following biosolids application. *The Forest Alternative Symposium Proceedings*.
- Brown, S., C. Henry, H. Compton, R. Chaney and P. DeVolder. 2000. Using municipal biosolids in combination with other residuals to restore a vegetative cover on heavy metal mine tailings. pp. 665-670. In W. Daniels and S. Richardson (eds.) *Proc. 17th Nat. Mtg. Amer. Soc. Surface Mining and Reclamation* (June 11-15, Tampa, FA).
- Brown, S., C. Henry, H. Compton, R. Chaney and P. DeVolder. 2000. Using municipal biosolids in combination with other residuals to restore metal-contaminated mining areas. Chapter 1; 12 pp. *Proc. Symp. Mining, Forest and Land Restoration: The Successful Use of Residuals/Biosolids/Organic Matter for Reclamation Activities* (Denver, CO, July 17-20, 2000). Rocky Mountain Water Environment Association, Denver, CO.
- Chaney, R.L., S.L. Brown, J.S. Angle, T.I. Stuczynski, W.L. Daniels, C.L. Henry, G. Siebielec, Y.-M. Li, M. Malik, J.A. Ryan and H. Compton. 2000. In situ Remediation/Reclamation/Restoration of Metals-Contaminated Soils using Tailor-Made Biosolids Mixtures. Chapter 2; 24 pp. *Symp. Mining, Forest and Land Restoration: The Successful Use of Residuals/Biosolids/Organic Matter for Reclamation Activities* (Denver, CO, July 17-20, 2000). Rocky Mountain Water Environment Association, Denver, CO.
- Brown, S. and C.L. Henry. 1999. Using Biosolids for Reclamation/Remediation of Disturbed Soils. US EPA Special Publication.
- Brown, S. and C.L. Henry. 1999. Building Partnerships with EPA Superfund. *Proceedings Water Environment Federation Residuals Conference*, Charlotte, NC January 20-23.
- Henry, C., D. Sullivan, R. Rynk, K. Dorsey, and C. Cogger. 1999. Managing Nitrogen from Biosolids. WDOE Pub. No. 99-508. Olympia, WA. I was primary author on the following chapters:
- Chapter 1: Introduction
 - Chapter 2: The Nitrogen Cycle
 - Chapter 3: Overview of the Nitrogen Balance Approach and Guidelines for Reducing Risks of Nitrate Leaching
 - Chapter 4: Using the Nitrogen Balance Approach for Estimating Net Plant-Available Nitrogen from Biosolids
 - Chapter 6: Using the Nitrogen Balance Approach for Forest Systems
 - Chapter 8: Overview of the Balanced Soil Amendment Approach for Mixtures of Biosolids and Carbon-Rich Residuals
- Leonard, P., and C. Henry. 1999. Success story: The Mountains to Sound Greenway Biosolids Forestry Program. US EPA Special Publication.
- Henry, C., and P. Leonard. 1998. A New Paradigm to Tailoring Compost Standards. *Proceedings, Beltsville Symposium on Co-Utilization of Residuals*.

- S. Brown, C. Henry, R. Chaney, and H. Compton. 1998. Bunker Hill Superfund Site: Ecological Restoration Program. Proceedings ASME Annual Meeting, May 1998.
- S. Brown, C. Henry, and R. Chaney. 1998. Biosolids and Fly Ash Used to Restore the Bunker Hill Superfund Site. US EPA Tech Trends, May issue.
- Henry, C. 1998. Why the universities are involved in biosolids management. Proceedings Water Environment Federation Residuals Conference, Bellevue, WA, July, 1998.
- Henry, C., and M. Van Ham. 1996. Biosolids Management in the Pacific Northwest: an Overview of Land Application Programs. Proceedings of Land Application of Wastes in Australia and New Zealand: Research and Practice. 29 Sept - 4 Oct.
- Henry, C. 1996. The new book of biosolids management and roles of sustainability. Proceedings of Land Application of Wastes in Australia and New Zealand: Research and Practice. 29 Sept - 4 Oct.
- Henry, C. 1996. Biosolids and nitrogen management in forest ecosystems. Proceedings of Land Application of Wastes in Australia and New Zealand: Research and Practice. 29 Sept - 4 Oct.
- Henry, C., M. Van Ham, R. King, and P. Leonard. 1994. Fertilizing forests with biosolids: Experiences in the Pacific Northwest. Water Environment Specialty Conference Proceedings. Washington D.C. June 1994.
- Harrison, R.B., C.L. Henry and D.W. Cole. 1993. Long-term changes in carbon content and chemistry of forest soils receiving high rates of organic matter amendments. Proceedings of the Sixth North American Forest Soils Conference. University of Florida, Gainesville, Florida.
- Harrison, R.B., C.L. Henry, D. Xue and D.W. Cole. 1993. Reciclagem de residuos industriais e florestais em áreas de reflorestamento. Presented at the First Symposium on Brazilian Forest Research. May 10-14, 1993. Belo Horizonte, Minas Gerais, BRAZIL.
- Henry, C., R. Harrison, and D. Cole. 1993. Effect of use of organic residuals on forest ecosystems. In Environmental Influence of Soil Amendments on Biotic Systems. Lewis Publishers.
- Henry, C. 1993. Fundamentals of land application of biosolids. Proceedings of the 1993 BCWWA Conference, Vernon, B.C.
- Henry, C., and R. Harrison. 1992. Fate of trace metals in sewage sludge compost. Biochemistry of Trace Metals. CRC Press, Inc.
- Henry, C.L. 1990. Nitrogen dynamics of pulp and paper sludge to forest soils. Proceedings of the Third IAWPRC Symposium on Forest Industry Wastewaters, Tampere, Finland.
- Henry, C., and D. Cole. 1986. Pack Forest Sludge Demonstration Program: history and current activities. pp. 461-471 IN Cole, D., C. Henry and W. Nutter, eds. The Forest Alternative for Treatment and Utilization of Municipal and Industrial Wastewater and Sludge.
- Henry, C., C. Nichols and T. Chang. 1986. Technology of forest sludge applications. pp. 356-366 IN Cole, D., C. Henry and W. Nutter, eds. The Forest Alternative for Treatment and Utilization of Municipal and Industrial Wastewater and Sludge.
- Henry, C.L. 1986. Growth response, mortality and foliar nitrogen concentrations of four tree species treated with pulp and paper and municipal sludges. pp. 258-265 IN Cole, D., C. Henry and W. Nutter, eds. The Forest Alternative for Treatment and Utilization of Municipal and Industrial Wastewater and Sludge.
- Cole, D., and C. Henry. 1986. Future directions and needs: sludge applications. pp. 62-69 IN Cole, D., C. Henry and W. Nutter, eds. The Forest Alternative for Treatment and Utilization of Municipal and Industrial Wastewater and Sludge. University of Washington Press, Seattle, WA.
- Henry, C., and D. Cole. 1985. Pack Forest sludge and wastewater utilization programs. Proceedings NCASI Regional Meeting, May 1985, Portland, OR.
- Henry, C.L. 1985. The use of sludge as a soil amendment. Proceedings Western Washington Horticulture Assn. 75th Annual Meeting, January 1985, Olympia, WA.
- Cole, D., M. Rinehart, D. Briggs, C. Henry, and F. Mecifi. 1984. Response of Douglas-fir to sludge application: volume growth and specific gravity. pp. 77-84 in TAPPI Proceedings, 1984 Research and Development Conference.
- Cole, D., C. Henry, P. Schiess, and R. Zasoski. 1984. The role of forests in sludge and wastewater utilization programs. IN A. Page, et al., eds., Workshop on Utilization of Municipal Wastewater and Sludge on Land.
- C. Henry. 1983. Sludge stability, erosion and runoff. pp. 76-81 IN C. Henry and D. Cole, eds., Use of Dewatered Sludge as an Amendment for Forest Growth.
- Cole, D., and C. Henry. 1983. Leaching and uptake of nitrogen applied as dewatered sludge. pp. 57-66 IN C. Henry and D. Cole, eds., Use of Dewatered Sludge as an Amendment for Forest Growth. Vol. IV. Inst. For. Resources, Univ. Washington, Seattle.

Books/Publications Edited

- Henry, C.L. 2007. **Understanding Biosolids Management**. <http://faculty.washington.edu/clh/understandingbiosolids/> Funded by the Henry M. Jackson Foundation.
- Henry, C.L., R. Harrison and R. Bastian (eds). 2000. **The Forest Alternative: Principles and Practice of Residuals Use**. Col. Forest Res. Publication, Seattle, WA.

- Henry, C. (ed). 1999. Nitrogen Management Guidance Manual for Washington. WDOE and NBMA publication.
- Henry, C., and R. Harrison. 1998. Environmental Effects of Biosolids Management. Trace Metals: Potential for Movement and Toxicity from Biosolids Application, Effects on Wildlife and Domestic Animals from Biosolids Application, Air Emissions and Ash Resulting from Incineration of Biosolids, Nitrogen Cycle and Nitrate Leaching from Biosolids Application, Microbial Activity, Survival and Transport in Soils Amended with Biosolids, The Fate of Trace Synthetic Organics in Biosolids Applied to Soil, Runoff Water Quality from Biosolids Application, Effects of Organic Residuals on Poplars. Northwest Biosolids Management Association.
- Henry, C. (ed). 1991. Technical Information on the Use of Organic Materials as Soil Amendments. The Compost Council.
- Henry, C., and R. Harrison. 1989. Literature reviews on environmental effects of sludge management: Trace Metals, Effects on Wildlife and Domestic Animals, Incinerator Emissions and Ash, Nitrogen, Pathogens, and Trace Synthetic Organics. Regional Sludge Management Committee.
- Cole, D., C. Henry and W. Nutter, eds. 1986. The Forest Alternative for Treatment and Utilization of Municipal and Industrial Wastewater and Sludge. University of Washington Press, Seattle, WA.
- Henry, C., R. Chapman-King, and D. Cole, eds.. 1983-5. Silvicycle: Information Network of Waste Utilization in Forest Lands. Inst. For. Resources, Univ. Washington, Seattle.
- Henry, C., and D. Cole (eds.) 1983. Use of Dewatered Sludge as an Amendment for Forest Growth. Vol. IV. Inst. For. Resources, Univ. Washington, Seattle.

Other Miscellaneous Papers

- Henry, C., and S. Palleroni. 2002. Design/construct program for wastewater treatment in rural Southeast India. p. 2. In Biosolids Bulletin. Feb.2002.
- Henry, C., and S. Palleroni. 2002. Design/construct program for wastewater treatment in rural Southeast India – Part 2. p. 2. In Biosolids Bulletin. Mar.2002.
- Henry, C. 2000. Best Management Guidelines for Application of Biosolids to Forest Lands. Washington Department of Ecology.
- Harrison, R.B. and C.L. Henry. 1994. Judging Compost. Grounds Maintenance Magazine page 12-16, March 1994.
- Henry, C. 1994. Best Management Guidelines for Application of Biosolids to Forest Lands. Washington Department of Ecology.
- Henry, C., and R. Harrison. 1992. Evaluation of yard waste and sludge compost as soil amendments. Biocycle.
- Henry, C. 1990. Evaluation of comments on the Proposed Standards for Management of Sewage Sludge: Non-agricultural land Application. NTIS.
- Henry, C., and M. Neuman. 1990. Literature review on nitrogen cycle and nitrate leaching from sludge application. Col. For. Res. Pub., Univ. Washington, Seattle.
- Neuman, M., and C. Henry. 1990. Summary of effects of sludge on wildlife and domestic animals from sludge application to forage. Col. For. Res. Pub., Univ. Washington, Seattle.
- Haub, A., R. Harrison, and C. Henry. 1989. Heavy metal immobilization in sewage sludge amended soils: annotated bibliography. Col. For. Res. Pub., Univ. Washington, Seattle.
- Haub, A., C. Henry, and R. Harrison. 1988. Municipal refuse composting: a literature review. Col. For. Res. Pub., Univ. Washington, Seattle.

Recent presentations at national/international/local meetings

- Speaker and poster presenter, North American Association for Environmental Education Annual Conference, Portland, OR (Scheduled Oct 09)
- Invited speaker, BioCycle International Conference on Waste Diversion, Composting and Renewable Energy San Diego (Apr 09)
- Invited speaker, Washington Technology Summit, Bellevue (Apr 08)
- Poster presentation, Guayaquil, Ecuador. El Taladro de la Tierra: Un nuevo diseño de “sanitario seco” (Mar 07)
- Invited speaker, Centro de Investigación Minera y Metalúrgica, Chile (Jun 05)
- Invited speaker at BioCycle West Coast Conference. San Francisco (Mar 05)
- W-170 Annual meeting - Las Vegas (Jan 05)
- Invited speaker, US EPA On-Site Coordinators Conference, Phoenix, AZ (Nov 04)
- Sustainable Campuses Conference, Portland, OR (Oct 04)
- Northwest Biosolids Management Annual Conference, Mt. Hood, OR (Sep 04)
- Invited speaker at BioCycle West Coast Conference. Portland (Mar 04)
- Northwest Biosolids Management Annual Conference, Chelan, WA (Sep 03)
- Invited speaker at national SSSA meeting, Denver, CO. (Nov. 03)
- Invited speaker at WERFConference, Bath, England (Jun 02)

Northwest Biosolids Management Annual Conference, Harrison Hot Sp., Canada (Sep 02)
 W-170 Annual meeting - Las Vegas (Jan 01)
 BioCycle West Coast Conference. Portland (Mar 01)
 Society of Ecological Restoration (Apr 01)
 Northwest Biosolids Management Annual Conference, Chelan, WA, WA (Sep 01)
 Sunnyside Rotary Club – Sunnyside, WA (12/01)

RESEARCH GRANTS

Current

2007-11 Mountains to Sound Greenway Program. King County Department of Natural Resources. \$160,000.

Past

2005-7 Operational Aspects of Septage application to Forest Land. Northwest Cascade. \$120,000 (with S. Brown).

2005-7 Biosolids Information and Education Program. Northwest Biosolids Management Association (with S. Brown) \$98,000.

2005-6 Biosolids for Biodiesel: Phase 2 Grant. USDA-SBIR. (with S. Brown, through Emerald Ranches) \$25,000

2005 Biosolids research on various issues regarding land application. King County Department of Natural Resources (with S. Brown, through NBMA). \$62,000.

2004-5 Septage Application Research and Demonstration. WA Dept. of Ecology. \$28,000

2004-5 Evaluation of Septage as a Soil Amendment/ Northwest Cascade. \$25,000

2003-4 Investigation of Farming Practices on Canola for Use in Making Biodiesel. USDA-SBIR. (with S. Brown, through Emerald Ranches) \$25,000

2003 Evaluation of Alternative Road Obliteration Soil Amendment Treatments using Biosolids Compost and Mill Residuals for Watershed Improvement. USFS. \$18,470.

2003 Handbook on the Use of Compost in Watershed Restoration. US EPA. \$9,200.

2001-02 Goodell Creek Gravel Mine Restoration. National Park Service. (with K. Ewing) \$43,000.

2000-01 Production of a position paper on biosolids use. Henry M. Jackson Foundation & King County. \$40,000.

2000-04 Mountains to Sound Greenway Program. King County Department of Natural Resources. \$275,000.

2000-04 Biosolids Information and Education Program. Northwest Biosolids Management Association (with S. Brown and R. Harrison) \$200,000.

2000-04 Biosolids Research on Various Issues Regarding Land Application. King County Department of Metropolitan Services (through Northwest Biosolids Management Association). \$320,000.

2000-03 Remediation of contaminated sites. USDA-Agricultural Research Service (Passed through by US EPA)(with Sally Brown). \$975,000.

2000-02 Development of a Position Paper on the Science and Efficacy of Recycling Biosolids. The Jackson Foundation \$20,000 and King County \$20,000.

1999-00 Compost and soil amendment potential of waste latex paint. King County Solid Waste Division \$5,000

1998-99 Remediation of contaminated sites. USDA-Agricultural Research Service (Passed through by US EPA)(with Sally Brown). \$225,000.

1998-00 Sustainable Resource Sciences and Compost facility.

Tools for Transformation	\$130,000
King County Solid Waste Division	10,000
City of Seattle	1,000
UW Physical Plant	20,000

1997 Technical resource center. US EPA (through Northwest Biosolids Management Association). \$37,000.

1997-8 The effect of biosolids on watersheds. Mountains To Sound Greenway Trust. \$36,000.

1996 -00 Mountains to Sound Greenway Program. King County Department of Metropolitan Services. \$255,000.

1994-98 Biosolids Information and Education Program. Northwest Biosolids Management Association (with R. Harrison) \$225,000.

- 1994-8 Biosolids Research on Various Issues Regarding Land Application. King County Department of Metropolitan Services (through Northwest Biosolids Management Association). \$364,000.
- 1994 Assessment of the Use of Biosolids to Immobilize Trace Metals in Tire Ash. City of Everett (through Northwest Biosolids Management Association). \$11,175.
- 1994 Investigation of Changes in Compost Production to Decrease Mushroom Occurrence. Northwest Cascade. \$4654.
- 1993 Lone Star Northwest Biosolids Demonstration Program. Pierce County Department of Utilities. (with R. Harrison) \$102,857.
- 1991-94 Assessing the toxicity and uptake of trace metals by plants grown in compost-amended soil. Procter and Gamble Corporation. (with R. Harrison). \$153,939.
- 1991-94 Production of technical issue papers and evaluation of composts as soil amendments. Recomp of Washington, Inc. (with R. Harrison). \$113,563
- 1991-94 Determination of Market Value and Market Capacity Assessment for Compost Derived from Mixed Organic Material. Procter and Gamble Corporation. (with R. Harrison). \$293,222
- 1991-92 Estuary Contamination. Tacoma-Pierce County Health Department/Washington Department of Ecology (Co-PI with R. Harrison). \$5,520.
- 1991 King County Fair Demonstration Project. King County Solid Waste Department. (Co-PI with R. Harrison) \$16,370.
- 1991 Septic Leaching. Tacoma-Pierce County Health Department/Washington Department of Ecology. (Co-PI with R. Harrison) \$7,980.
- 1991 Deep leaching of septage constituents in coarse textured soils. Pierce Co/Washington State DOE. (Co-PI with R. Harrison). \$9,800.
- 1990-91 Sludge Nitrogen Mineralization Study (with R. Harrison). Eight Cities in Oregon. \$33,750.
- 1990 Technical information gathering on compost. Washington Department of Ecology. \$34,500.
- 1990-91 Risk assessment for non-agricultural sludge applications. U.S. EPA. \$39,500.
- 1989-93 Cooperative Agreement - Sludge Information and Education Program. Regional Sludge Management Committee. \$873,694.
- 1989 Pierce County Utilities Sludge Management Program. Pierce County Utilities. \$9,850.
- 1989 Comments on the Proposed Rule to Regulate the Disposal and Use of Sewage Sludge. U.S. EPA - NNEMS Fellowship Award. \$7,500.
- 1989-90 Island County Solid Waste Compost Evaluation (with R. Harrison). Island County/WDOE. \$39,792.
- 1987-88 Evaluation of DellChem Treatment Sludge as a Soil Amendment. Seattle, Metro. \$24,889.
- 1987-89 Evaluation of GroCo as a Soil Amendment (with R. Harrison). GroCo, Inc. \$19,950.
- 1985-86 Pack Forest Sludge Management Program. Washington Department of Ecology. \$158,479.
- 1985-87 Use of Pulp and Paper Sludge as a Forest Soil Amendment. Washington Department of Ecology. \$25,935.
- 1985-87 Use of Pulp and Paper Sludge as a Forest Soil Amendment. Crown Zellerbach. \$31,962.
- 1984-92 Pack Forest Sludge Demonstration Program - Design, Construction and Operations. Seattle Metro. \$860,534.
- 1984-90 Pack Forest Sludge Demonstration Program - Monitoring and Evaluation. Seattle Metro. \$262,280.
- 1984-85 Pulp and Paper/Municipal Sludge Nursery Bed Growth Study. City of Tacoma. \$1,000. Boise Cascade. \$1,000.
- 1983 Pack Forest Sludge Demonstration Program - Planning. Seattle Metro. \$65,340.

AWARDS RECEIVED FOR RESEARCH & EDUCATION PROGRAMS:

- 2009 Terry Husseman Sustainable School Creative Environmental Curriculum Award.
- 2009 Earth Hero Schools Award for Sustainability: Eastside Prep Impact Center for Urban Sustainability.
- 2007 US EPA Clean Water Award for Innovative Biosolids Management (w. S. Brown)
- 2005 Green Globe Award from King County (w. S. Brown)

- 2004 Passion, Vision and Grit National Award from BioCycle Magazine.
- 2003 National Council of Architectural Registration Boards' 2003 competition for Creative Integration of Practice and Education (w/ S Palleroni, UW and D Reilly, Penn. State U.)
- 2001 Association of Washington Business Environmental Award – Clean-up (w/ S Brown, UW and C. Robertson, Avista Corp.)
- 2001 Co-semi finalist 2001 DISCOVER Magazine Awards for Technological Innovation
- 1999 Green Globe Environmental Award from King County
- 1999 Best Educational Exhibit - WSRA Annual Convention, Ocean Shores.
- 1996 Mountains to Sound Greenway Trust, King County, Weyerhaeuser, Washington Department of Natural Resources, and the University of Washington for excellence in the Mountains to Sound Greenway Biosolids Program, from US EPA
- 1992 Special award presented to W-170 (Western regional, USDA) Committee for contributions in developing scientifically-based CFR503 national regulations for utilization of sewage sludge as a soil amendment, from Association of Metropolitan Sewerage Agencies
- 1992 Organic Waste Beneficial Use Program at the College of Forest Resources, University of Washington for excellence in research in utilization of biosolids as a soil amendment, from US EPA.
- 1991 W-170 (Western Regional, CREES) Research Committee for excellence in research program on beneficial utilization of sewage sludge, from US EPA

Feature Articles at University of Washington

- University Week* "UW-initiated biosolids project wins national clean water award" (Oct '07)
- Motor Pool Spring (06)* "Spotlight on Clients Interview with Chuck Henry By L. Austin"
- NewsletterUW Daily* (02) "Do the Right Thing"
- UW Renews Letter* (compost facility) (99)
- Windows on Computing* "Connecting, Including and Preparing: the SRS Approach" (Sp 99)
- UWired website* (SRS program and interaction with UWired) (98)
- University Week* "Not your average pile of trash" (5/4/00) "From major headache to boon: Biosolids are in demand" (Jan 29, 98), "Food waste added to the mix for campus sustainable resource studies", "Green Globe Award goes to UW sustainable resource effort" (5/27/99).

CLASSES TEACHING/TAUGHT

2006-9	Eastside Preparatory School	
	Environmental Practices	'09
	Art Meets Science (co-taught)	'09
	Physics	'07-9
	EPIC Urban Sustainability	'07-9
	Environmental Science	'08-9
	Chemistry	'06-7
	Digital Reality (co-taught)	'06-7
2003-06	University of Washington, Bothell	
	SEED II Teachers in Costa Rica	Au '06
	GIS	W '06
	Water and Sustainability	Sp, Au '04,Au '05
	Environmental Problem Solving	Sp, Au '04,Au '05
	SEED (Env Ed for Teachers; w/Kubota, Groom, Eisele)	Su '05

	Sustainable Practices (UWS & UWB)	W, Sp '05, '06
	Compost and the Use of Organic Amendments	Sp '05, '06
	Recycling: Ethics, Opportunities and Realities	W '04, '05, '06
	Soils Laboratory	Au '03, W '05
	International Sustainable Practices (UWS, UWB)	Sp '04, '05, Au '05
	International Environmental Assessment (w/Brown)	Au '05
	International Cultures (w/Schmidt)	Au '05
	Exploring Energy Solutions for Planet Earth (UWS)	W '04
	Water Quality	W '04
	Wildland Soils and Plants (w/Gold)	Su '04
	Environmental Chemistry	Au '03
	Engineering Economy	Au '03
1984-03	University of Washington:	
	Sustainable Practices (in India, Mexico, Montana)	'02-03
	Compost and the Use of Organic Amendments	'95-03
	Introduction to Sustainable Resource Sciences	'00-2
	Integrating Renewable Energy into Society	'01-3
	Survey of Soil Restoration (in Colorado)	'00
	Wildland Soils	'94-02
	Building a Sustainable Campus	'00
	Soils for Salmon	'00
	Recycling: Ethics, Opportunities and Realities	'97-00
	Tools for the Environmental Scientist	99
	Soils and Land Use	'84-6, '97
	Introduction to Soils	'91-2
1997	Bodenkultur Universitat, Forest Institute, Vienna, Austria.	
	Use of Organic Residuals in Forest Landscapes.	
1982-4	Highline Community College: Mechanics of Materials, Civil Engineering Drafting.	
1979-80	Olympia Technical Community College: All engineering classes required for Civil Engineering Technology Associate Degree, including engineering orientation, statics, dynamics, mechanics of materials, fluid mechanics, hydrology, drafting, construction materials, soil mechanics, surveying.	
1975-76	Oregon State University: Teaching assistant for Sanitary Engineering classes.	

GRADUATE STUDENT COMMITTEES

Chair of committees:

Diane Nelsen	M.S. (in progress)	Soils
Linda Gaulke	M.S. 2004	CEE
Sean Smuckler	M.S. 2003	Soils
Karen Bergeron	M.S. 2003	Soils
Peter Severtson	M.S. 2003	Soils
Daniel Thompson	M.S. 2000	Soils
Mark Cullington	M.S. 2000	Soils

Isabel McClure	M.S. 2000	Soils
Mark Grey	Ph.D. 1999	Soils
Dan Bennett	M.S.1999	Soils
Paul Rosenfeld	Ph.D.1999	Soils
Neil Cowley	M.S. 1998	Soils
Mark Grey	M.S. 1994	Ecosystems
Served on committees:		
Dana Devin-Clarke	M.S. 2007	Soils
Ingrid Clausen	M.S. 2006	Soils
Mark Merkelbach	M.S. 2006	CEE
Gemma Alexander	M.S. 2003	UH
Barbara Christensen	M.S. 2002	Soils
Alex Svendsen	M.S. 2002	Soils
Gage Wagonner	M.S. 2002	Soils
Barry Flaming	M.S. 2001	Soils
Pam DeVolder	M.S. 2000	Soils
Amy Sidell	M.S.2000	Soils
Janita Gurung	M.S.1999	Soils
Doug Rowell	PhD.1999	Forest Ecology - UBC
Paul Kramer	M.S. 1998	Soils
Barbara Deutsch	M.S. 1997	Landscape Arch.
John Bagbe	M.S. 1995	Ecosystems
Stacey Wenger	M.S. 1995	Urban Horticulture
Sara A. Brallier	M.S. 1992	Forest Resources
Jana Krejzl	M.S. 1992	Forest Resources
Andy Haub	M.S. 1992	Civil Engineering

WORK EXPERIENCE

2011-Pres	Sanitary Engineer, Chemonics International, US AID funded Rampup-South Program.
2003-Pres.	Senior Lecturer, Environmental Science, University of Washington Bothell, Bothell, WA.
2006-2011.	Science Faculty, Eastside Preparatory School, Kirkland WA.
1995-2003	Research Associate Professor, Sustainable Practices, Forest Soils and Organic Residuals Management. University of Washington College of Forest Resources, Seattle, WA.
1990-94	Research Assistant Professor, Forest Soils and Organic Waste Management. University of Washington College of Forest Resources, Seattle, WA.
1983-90	Associate Program Director, Organic Waste Management Program. University of Washington College of Forest Resources, Eatonville, WA.
1982-83	Research Assistant, Sludge Management Research. University of Washington College of Forest Resources, Seattle, WA.
1979-82	Project Engineer and Vice President. Sigma Engineers, Inc., Olympia, WA.
1979-80	Civil Engineering Technology Instructor. Olympia Technical Community College, Olympia, WA.
1976-79	Project Engineer, Sanitary and Hydraulic Systems. Arvid Grant and Associates, Inc., Olympia, WA.

CONSULTING PROJECTS (1988-2007)

2006-7	Compost process evaluation, Pacific Topsoils.
2006-7	Composting toilet design for beaches in Ecuador. Sambito.
2003	Expert witness, biosolids lawsuit. Eagle North America.
2001	Remedial techniques for contaminated smelter sites in Mexico. Veridian Environmental. Evaluation of Alder Lake Park Effluent System. City of Tacoma.
2000	Evaluation of the nitrogen balance of effluent from a wetland treatment system applied to forests. Tacoma City Light. Development of a white paper on ammonia volatilization/expert witness for biosolids application lawsuit. Synagro Alternatives for industrial biosolids management. DuPont – Victoria, Texas
1998	Long range plan for sustainable forestry using residuals. The Muswellbrook Shire, NSW, Australia.
1996	Assistance in research project design for land application of pulp and paper residuals. Weyerhaeuser Co., \$1000.

- 1995 Technical review of Ecological Risk Assessment for Land Application of Biosolids for EPA (subcontract with Oakridge National Laboratories). \$500.
Technical input on EPA Process Design Manual for Land Application of Biosolids (subcontract with Eastern Research Group). \$500.
- 1994 Nitrogen dynamics studies following application of combinations of municipal biosolids and pulp and paper biosolids for the Greater Vancouver Regional District. Studies included lab and field mineralization studies, field volatilization and denitrification studies, and changes in soil nitrogen (subcontract of Silva Environmental).
Expert witness for trial in California regarding land application of biosolids. Wright and Associates. \$600.
Review and technical input on EPA Process Design Manual for Land Application of Biosolids (subcontract with Eastern Research Group). \$1500.
- 1993 Basics of biosolids management: Preparation of paper and presentation. British Columbia Water and Wastewater Association. \$1500.
Development of a monitoring plan and installation of monitoring equipment for the City of Spokane, WA for their composting facility. \$2750.
Column leaching study for the Greater Vancouver Regional District to investigate nitrate production from combinations of municipal biosolids and pulp and paper biosolids (subcontract of Silva Environmental).
- 1992 Literature review of emissions of volatile and odorous organic compounds from municipal waste composting facilities. The Procter & Gamble Company. \$26,025.
Soils consultation, analysis and interpretation for hazardous waste site. Du Pont Engineering. \$3,226.
Preparation of updates to the literature review on technical information on compost quality. The Composting Council. \$6,318.
Assistance in production of 40 CFR 503. US EPA. \$2,000.
Peer review of *Usage and Benefits of MSW Compost*. University of Florida. \$1090.
- 1991 Speaker at Science and Technology of Composting Seminars. The Procter & Gamble Company. \$3486.
Participation in the Northeast Regional Solid Waste Composting Conference in Albany, New York. The Procter & Gamble Company. \$2212.
Review of proposed olestra soil effects study by Dr. Terry Logan, and participation in review meeting in Denver. The Procter & Gamble Company. \$748.
Sludge management plan and site demonstration evaluation and design for Greater Vancouver Regional District. ABR. \$10,000.
Test project for use of compost in road runoff storm water quality control. W & H Pacific. \$10,000.
Peer review of USEPA Pulp and Paper sludge Regulations. US EPA. \$1500.
- 1990 Presentation and attendance at workshops on "Land-based Options for Beneficial Sludge Re-use" in Vancouver and Nanimo. Greater Vancouver Regional District. \$900.
Assistance in production of State of Washington Compost Classification/Quality Standards. Cal Recovery Systems, Inc. \$1,800.
Site visitation, sludge analysis, site sludge loading analysis and recommendations. City of Oak Harbor. \$968.
Review of analysis and recommendations for sludge loading limits. City of Oak Harbor. \$250.
Assistance in feasibility study using sludge-amended crops for production of alcohol. Wildman Consulting. \$2,000.
Evaluation of Portland composted sludge as a soil amendment. City of Portland. \$9850.
- 1989 Response of second-growth Ponderosa Pine growing on volcanic ash impacted soil to several treatments: volatilization and denitrification measurements. USDA Forest Service Laboratory. \$2,000.
Field and laboratory studies of denitrification: Simplot Project. Cascade Earth Sciences, Ltd. \$4637.
Kittitas County dryland tree project. O'Neill and Sons. \$1,400.
Assistance in Tulalip Tribe sludge management program. Cascade Earth Sciences, Ltd. \$2148.
Installation of lysimeters at Bremerton site. CH2M-Hill, Inc. \$929.
Planning assistance for Agnew Tree Farm Sludge Applications. Solganic Services Corp. \$515.
Analysis and leaching study on MSW compost. Lonergan & Associates, Inc. \$500.
- 1988 Production of the report entitled *Heavy metal immobilization of sewage sludge amended soils*. Department of Environmental Quality. \$2500.
Evaluation of trace metals levels in grasses grown in sludge. City of Tacoma. \$500.
Development of technical response to regulations in regards to pH control. City of Tacoma. \$8310.
Technical assistance on sludge regulations. Department of Ecology. \$2495.